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July 2001

Bolivia

Bolivia is on its way to becoming a natural gas hub for the Southern Cone. The country's oil and natural gas production potential has not yet been reached.

Note: Information contained in this report is the best available as of July 2001 and can change.



BACKGROUND

Bolivia, one of the poorest countries in South America, is enduring a period of political and economic difficulties. A slower world economy in 2001, especially in the United States and in Bolivia's neighbors, has translated to slower-than-expected economic growth in Bolivia. There are hopes that increased natural gas exports to neighboring [Brazil](#), currently in the grips of a critical energy shortage, could help boost Bolivia's economic conditions. Foreign direct investment in Bolivia peaked in 1999, as privatization brought in record revenues of about \$1 billion. Investment is expected to be about half that amount for 2001 and 2002, with increased activity in the oil and gas sectors as the driving force.

Bolivia was the second country in South America (after Chile) to implement International Monetary Fund "structural adjustments" in the 1980s, and the 1990s saw the privatization of the five largest state-held

companies. After difficult years at the end of the 1990s, strict economic policies that reigned in government spending were expected to result in strong gross domestic product growth for 2000-2002. Also in the last few years, there have been collaborative efforts with the United States to control growth of coca plants, which contribute to illicit drug trade.

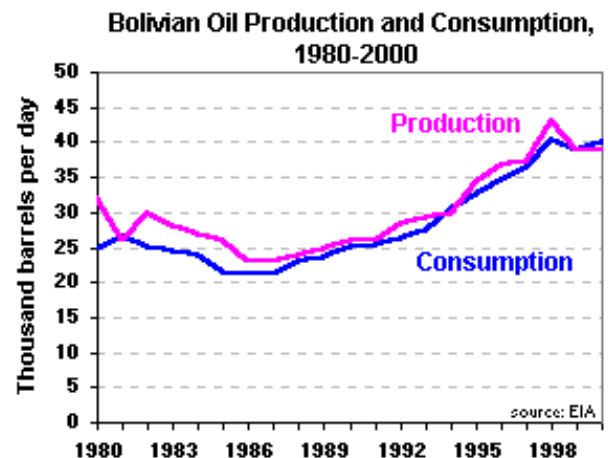
These economic policies, while resulting in stronger economic indicators for Bolivia, have contributed to social unrest. The government has been slow to implement anti-poverty programs, which are required by the country's status as one of the World Bank's Highly Indebted Poor Countries. In 2000 and 2001, protestors

have demanded more public investment in rural areas and an end to the coca eradication scheme. In spring 2001, blockades were regularly halting traffic on many of the country's major highways around the capital, La Paz. Bolivian President Hugo Banzer was diagnosed with lung and liver cancer in July 2001, and reportedly plans to remain in Washington, D.C. for treatment. He announced in late July intentions to step down on August 6, leaving the government in the hands of current Vice President Quiroga.

A border dispute between Bolivia and Chile has left Bolivia without access to the Pacific Ocean since 1884. The two countries severed diplomatic relations over the issue in 1978, but rapprochement now appears possible, as Chile reportedly is considering an arrangement that would allow Bolivia Pacific access on Chilean soil. Meanwhile, Bolivia is considering expanding its natural gas exports to include liquefied natural gas (LNG), which could be shipped world-wide from a port in Chile.

OIL

As of January 1, 2001, Bolivia's total proven oil reserves amounted to 396.5 million barrels (an increase of 265 million barrels since 2000). Bolivia is relatively self sufficient in oil, consuming an estimated 40,000 barrels per day (bbl/d), slightly more than it produced (around 38,900 bbl/d), during 2001. Almost all crude oil produced in Bolivia is for domestic consumption, except for a small amount that is exported to Chile through the Sica-Sica-Arica pipeline.



Industry Organization

The privatization of *Yacimientos Petroliferos Fiscales Bolivianos* (YPFB), the Bolivian state oil company, has been in progress since passage of the 1994 Capitalization Law. The law paved the way for partial privatization of several national industries. YPFB was divided into two upstream units, a transport company, a refining company, and several service companies. The two upstream units were privatized in 1996/1997, with sales to U.S.-based Amoco (now BP) and a consortium of Argentine YPF (now Repsol YPF), Perez Companac, and Pluspetrol. The transport company, Transredes, was sold to a consortium of U.S.-based Enron and Royal Dutch/Shell.

In 1994, a Superintendency of Hydrocarbons was established to regulate the oil and gas industries. Its responsibilities include implementing the relevant laws, granting concessions and licenses, and ensuring a competitive industry. Once YPFB has sold its remaining assets, it is expected to take on a new role as the administrator of international negotiations and contracts with foreign oil companies.

Bid Rounds

Bolivia has held annual oil and natural gas exploration and production licensing rounds since 1997. In 1997, 16 blocks were awarded. Only six blocks were awarded in 1998, and five in 1999. In 1999, Pluspetrol was the only bidder. One block each was awarded to Petrogas Energy and Matpetrol in 2000. In 2001, a bid round started in May, with no activity reported as of July 2001. Companies have requested that the government change the terms of the licenses. Currently, companies are required to drill an exploration well per every 25,000 hectares of a block, and all finds must come onstream within four years. Companies favor a change that would allow them to drill and produce only when world market conditions were favorable for new production.

Downstream

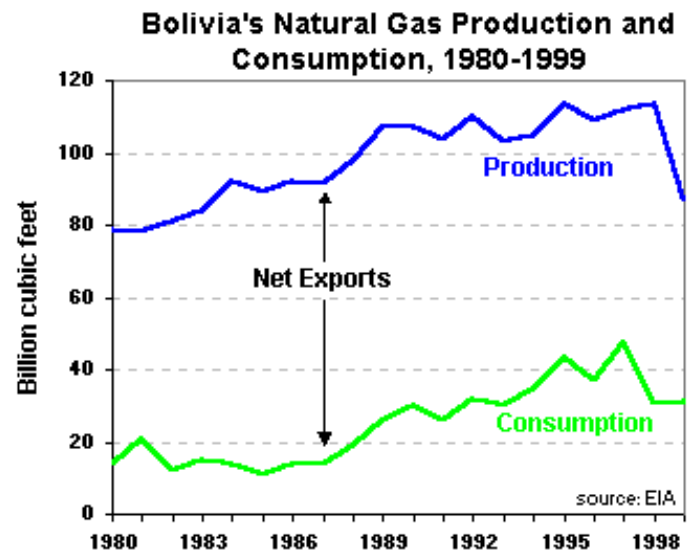
Of Bolivia's 63,000 bbl/d in crude oil refinery capacity, YPFB owns and operates 3,000 bbl/d. The other 60,000 bbl/d was sold to Petrobras and Perez Companac as part of the wider privatization scheme in November 1999. Oil storage facilities, some domestic pipelines, and airport jet fuel terminals have also been sold, leaving only retail gasoline and diesel stations to be privatized. Dates for this final step have not been announced.

In July 2000, Bolivia introduced a "price collar" mechanism to prevent retail gasoline prices from fluctuating with world oil prices. The retail price is pegged to an international reference price, so higher prices lead to refiners accruing debt, while lower prices then reduce that debt. However, crude prices have averaged higher than expected, resulting in unsustainably high debt for producers and refiners. The government hopes to decide how to respond to this situation in early August.

NATURAL GAS

While Bolivia's *proven* natural gas reserves stand at 18.3 trillion cubic feet (Tcf), *likely* reserves are as high as 70 Tcf. Bolivia has been producing natural gas since the 1960s, mostly for export to Argentina. Exports to Argentina ended in 1999, the same year that exports to Brazil began. The domestic Bolivian gas market is small, and while it is expected to grow, export markets will remain the key destination for Bolivian gas.

Aggressive exploration efforts in recent years have led to many large discoveries, with several fields over 5 Tcf. Blocks containing significant gas reserves include Block 20 (Tarija West), San Antonio and San Alberto, El Dorado, and Caipipendi. Caipipendi contains what is currently the largest field, Margarita, which holds over 13 Tcf, according to some estimates. Growth in supply has out-paced growth in demand, and exploration has slowed considerably since 1999.



Pipelines

The Bolivia-to-Brazil pipeline, tapping Bolivia's Rio Grande sources, came onstream in July 1999. It is the largest private sector infrastructure project in South America, and partners include Enron (although Enron is planning to sell its share), Shell, Petrobras, BG Group (British Gas), TotalFinaElf, and El Paso. The project began in 1996 and cost \$2.1 billion. It serves Sao Paulo, Brazil, with an extension southward to Porto Alegre. The completed pipeline covers almost 2,000 miles.

The pipeline is not being used at its full capacity, which was the subject of a discussion between the Bolivian and Brazilian presidents in June 2001. The presidents agreed to make more Bolivian gas available to Brazil, sooner rather than later. Specific details concerning how that might come about were not discussed.

Gas from the pipeline was expected to fuel a boom in Brazilian electricity demand (the first Brazilian power plant fired by Bolivian gas has just come online), but several factors have prevented this. First, regulatory hurdles in Brazil prevented power plant construction at the expected pace. Also, a controversy regarding Petrobras's preferential access to the Brazilian section of the pipeline further depressed Bolivian exports. BG appealed to the Brazilian courts and won rights to access the pipeline in spring 2001. Finally, the price of Bolivian gas exports was established by a 1996 agreement linking export prices to a basket of fuel oil prices. Consistently higher-than-expected oil prices in recent years have made Bolivian gas uncompetitively expensive. Bolivia reportedly is considering changing the pricing.

Bolivia's San Alberto and San Antonio fields began exports to Brazil in January 2001. The gas travels through an existing pipeline, connecting to the Bolivia-to-Brazil pipeline for transmission to Brazil. The Superintendency of Hydrocarbons is considering whether to agree to have Petrobras construct a new gas pipeline along this route, allowing Petrobras to transport gas from the San Alberto and San Antonio fields that it operates in partnership with Repsol-YPF and TotalFinaElf. The new pipeline would require an investment of \$300 million, which would be invested equally by the three firms. The pipeline could be completed by the end of 2002.

Liquefied Natural Gas and Gas-to-Liquids

In July 2001, Bolivia's largest gas producers, Repsol-YPF, BG, and BP, decided to form a Pacific liquefied natural gas (LNG) export consortium in hopes of delivering Bolivian gas to the U.S. market. The project could involve constructing a 430-mile pipeline from Bolivia's Margarita field to a port in northern Chile, where a two-train liquefaction plant would be built. The gas could then be shipped to a regasification plant in northern Mexico, and piped to northern Mexican and U.S. destinations. The entire project would cost an estimated \$6-\$7 billion.

The Bolivian government is promoting gas-to-liquids (GTL) technology as an alternative solution to bring its stranded gas to market. The technology converts natural gas reserves into liquid fuels, which can then be exported without pipelines. Unlike LNG, GTL does not require capital-intensive re-gasification terminals. The largest GTL operation in the country so far is a 10,000 bbl/d plant that will produce diesel fuel for the domestic market. Skeptics are concerned that GTL is not a cost-effective means of exporting Bolivian gas, especially as the country is landlocked and has under-developed road infrastructure.

ELECTRICITY

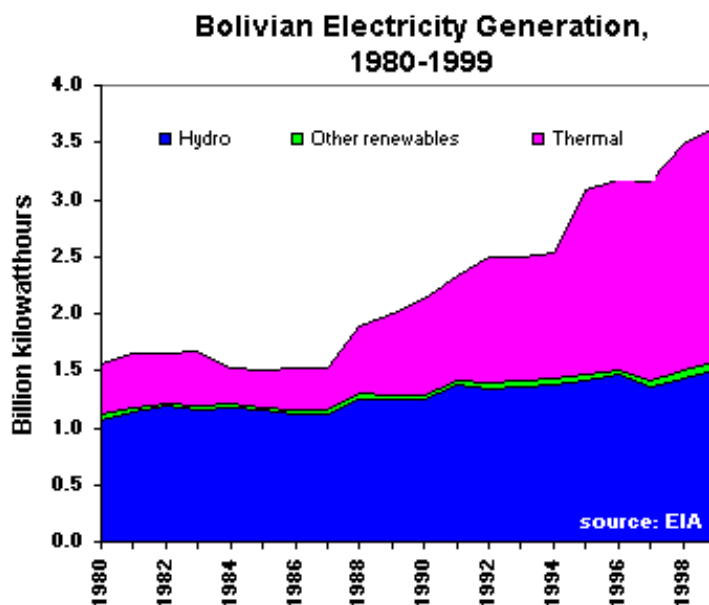
Approximately 33% of Bolivia's installed electric capacity is hydroelectric and 67% is thermal. In 1999, the country generated about 3.6 billion kilowatthours of electricity, 57% of which was thermal and 42% of which was hydropower. The share of thermal generation has grown rapidly in recent years.

In 1994, Bolivia passed an electricity law that established the Superintendency of Electricity as the regulatory body for the Bolivian electricity sector. Its mandate includes protecting consumer rights; granting and amending concessions and licenses; approving international interconnections and stipulating the quantity of electricity exports and imports (should interconnections be established); supervising the activities of the National Committee of Load Dispatch, the body responsible for the coordination and administration of transactions on the national grid, the *Sistema Interconectado Nacional* (SIN); and approving and setting prices and tariffs for the electricity industry.

Generation

The 1994 law also divided the assets of ENDE, the national electric company, and separated the responsibilities for electric generation, transmission and distribution. Any generating company operating on the SIN is prohibited from owning more than 35% of national installed generating capacity. The law also stipulated that companies on the SIN are only allowed to participate in one activity: generation, transmission, or distribution. However, power companies that do not operate on the SIN are allowed to be vertically integrated.

There are four major generation companies in Bolivia: Guaracachi, Valle Hermosa, Corani and Cobee. Guaracachi, Valle Hermosa, and Corani are regional utilities that resulted when ENDE was split up. They are now 50% privately-owned (by U.S.-based Energy Initiatives, Constellation Energy, and Duke Energy, respectively) and the remaining 50% of each of the company's shares have been placed in private pension funds for Bolivians. The fourth generation company, Cobee, is owned by U.S.-based NRG Energy, and it operates in the La Paz and Oruro departments. It has always been privately owned and is subject to slightly different regulations than the other three generators.



Eight hydroelectric plants power the SIN, with Corani and Cobee supplying the bulk of the power. The country's significant hydropower potential has not yet been fully exploited. Several new hydro plants are in various stages of the planning process. There are six thermal power plants on the SIN. Guaracachi and Valle Hermosa are the largest thermal generators. Thermal capacity has risen considerably in the last several years, and electricity supply now out-strips demand.

Transmission and Distribution

The national grid, the SIN, accounts for the vast majority of Bolivia's installed electric capacity and power generation, reaching five of the country's nine "departments". The grid was privatized in 1997 and is owned and operated by Empresa Transportadora de Electricidad, itself owned by Union Fenosa of Spain. A plan to expand the grid received regulatory approval in March 2001.

Although the SIN connects Bolivia's major cities, there are a few isolated systems. Furthermore, an estimated 77% of the country's rural population lives without electricity. The National Rural Electrification Program (Proner) will have increased rural electrification from less than 10% in 1998 to a target of 28% by the end of 2001. Bolivia has been developing alternative electricity sources for its isolated communities. Renewable energy sources such as solar and biomass fuel small power generators in the highlands. Also, grid connections are expanding to include areas previously not accessed by the grid.

Currently, Bolivia has no international grid interconnections. However, in December 2000, construction on the first export facility was inaugurated. A joint venture between Duke Energy and Petrobras will build two new power plants, one on each side of the Bolivia-Brazil border. Both plants will be fired by Bolivian natural gas. They will connect to the Brazilian grid, and are slated to go into service in December 2001.

As part of the restructuring of the electricity sector, Cobee and ENDE sold their distribution assets in 1996. Eléctropaz, CRE, and Elfec are the three largest distributors in Bolivia, together accounting for more than three-quarters of power sales. The government plans to offer several regional distribution companies for sale in the near future. In late 2000, the sales process for provincial electricity system Servicios Electricos Tarija SA (SETAR) was re-started by the solicitation of bids for the advisory contract to manage the privatization.

COUNTRY OVERVIEW

President: General Hugo **Banzer** Suarez (since August 6, 1997; will step down on August 6, 2001, when Vice President Jorge Fernando **Quiroga** Ramirez will become president)

Independence: August 6, 1825 (from Spain)

Population (2000E): 8.2 million

Location/Size: Central South America; 1,098,580 sq. km (424,164 sq. mi.), slightly less than three times the size of Montana/Central South America, southwest of Brazil

Major Cities: La Paz (executive capital), Sucre (judicial capital), Santa Cruz de la Sierra, Cochabamba

Languages: Spanish (official), Quechua (official), Aymara (official)

Ethnic Groups: Quechua (30%), Aymara (25%), Mestizo (mixed European and Indian ancestry- 25-30%), European (5-15%)

Religions: Roman Catholic (95%), Protestant and other (5%)

Defense (8/98): Army (25,000), Navy (4,500), Air Force (4,000)

ECONOMIC OVERVIEW

Minister of Economic Development: Carlos **Saavedra** Bruno

Minister of Finance: Jose Luis **Lupo**

Currency: 1 bolivianos (\$B)=100 centavos

Market Exchange Rate (7/26/01): US\$1 = \$B6.66

Gross Domestic Product (GDP at market exchange rates, 2000E): \$8.5 billion

Real GDP Growth Rate (2001E): 2.5%

Inflation Rate (consumer prices, 2001E): 1.8%

Current Account Balance, as % of GDP (2001E): -\$0.5%

Merchandise Exports (2001E): \$1.2 billion

Merchandise Imports (2001E): \$1.6 billion

Net Merchandise Trade Deficit (2001E): \$0.4 billion

Major Export Products: Processed soya, zinc, natural gas, gold

Major Import Products: Capital goods, raw materials, consumer goods

Major Trading Partners: United States, Argentina, Brazil, Peru

ENERGY OVERVIEW

Proven Oil Reserves (1/1/01E): 369.5 million barrels

Oil Production (2000E): 38,900 barrels per day (bbl/d), of which 29,900 bbl/d was crude oil

Oil Consumption (2000E): 40,000 bbl/d

Net Oil Imports (2000E): 1,100 bbl/d

Crude Oil Refining Capacity (1/1/01E): 63,000 bbl/d

Proven Natural Gas Reserves (1/1/01E): 18.3 trillion cubic feet (Tcf)

Natural Gas Production (1999): 86.9 billion cubic feet (Bcf)

Natural Gas Consumption (1999): 31.4 Bcf

Net Natural Gas Exports (1999E): 55.5 Bcf

Electric Generation Capacity (1/1/99): 1.04 million kilowatts (of which 67% is thermal, 33% is hydro)

Electricity Generation (1999): 3.6 billion kilowatthours

ENVIRONMENTAL OVERVIEW

Minister of Sustainable Development & Planning: Abaroa **Macleán** Ronald

Total Energy Consumption (1999E): 0.12 quadrillion Btu* (<0.1% of world total energy consumption)

Energy-Related Carbon Emissions (1999E): 1.9 million metric tons of carbon (<0.1% of world carbon emissions)

Per Capita Energy Consumption (1999E): 15.1 million Btu (vs. U.S. value of 355.8 million Btu)

Per Capita Carbon Emissions (1999E): 0.24 metric tons of carbon (vs U.S. value of 5.5 metric tons of carbon)

Energy Intensity (1999E): 17,727 Btu/ \$1990 (vs U.S. value of 12,638 Btu/ \$1990)**

Carbon Intensity (1999E): 0.28 metric tons of carbon/thousand \$1990 (vs U.S. value of 0.19 metric tons/thousand \$1990)**

Sectoral Share of Energy Consumption (1998E): Industrial (36.5%), Transportation (28.9%), Residential (29.5%), Commercial (5.1%)

Sectoral Share of Carbon Emissions (1998E): Industrial (31.8%), Transportation (45.2%), Residential (19.5%), Commercial (3.5%)

Fuel Share of Energy Consumption (1999E): Natural Gas (25.6%), Oil (61.0%), Coal (0.0%)

Fuel Share of Carbon Emissions (1999E): Oil (67.8%), Natural Gas (32.2%), Coal (0.0%)

Renewable Energy Consumption (1998E): 50.7 trillion Btu* (14% decrease from 1997)

Number of People per Motor Vehicle (1998): 19.2 (vs U.S. value of 1.3)

Status in Climate Change Negotiations: Non-Annex I country under the United Nations Framework Convention on Climate Change (ratified October 3rd, 1994). Bolivia ratified the Kyoto Protocol on November 30th, 1999.

Major Environmental Issues: Clearing of land for agricultural purposes and the international demand for tropical timber are contributing to deforestation; soil erosion from overgrazing and poor cultivation methods (including slash-and-burn agriculture); desertification; loss of biodiversity; industrial pollution of water supplies used for drinking and irrigation.

Major International Environmental Agreements: A party to Conventions on Biodiversity, Climate Change, Desertification, Endangered Species, Hazardous Wastes, Law of the Sea, Nuclear Test Ban, Tropical Timber 83, Tropical Timber 94 and Wetlands. Has signed, but not ratified, Environmental Modification, Marine Dumping, Marine Life Conservation and Ozone Layer Protection.

* The total energy consumption statistic includes petroleum, dry natural gas, coal, net hydro, nuclear, geothermal, solar, wind, wood and waste electric power. The renewable energy consumption statistic is based on International Energy Agency (IEA) data and includes hydropower, solar, wind, tide, geothermal, solid biomass and animal products, biomass gas and liquids, industrial and municipal wastes. Sectoral shares of energy consumption and carbon emissions are also based on IEA data.

**GDP based on International Energy Annual 1999.

OIL AND GAS INDUSTRIES

Organization: Yacimientos Petroliferos Fiscales Bolivianos (YPFB), foreign companies

Major Ports: None (landlocked)

Major Oil and Gas Blocks: Tarija, Tarija West, San Antonio, San Alberto, El Dorado, Caipipendi

Major Pipelines: Bolivia-to-Brazil

Major Refineries (crude oil capacity, 2001): Cochabamba (40,000 bbl/d), Santa Cruz (20,000 bbl/d), Sucre (3,000 bbl/d)

Sources for this report include: CIA World Factbook; Dow Jones; Economist Intelligence Unit ViewsWire; Financial Times; Oil Daily; Petroleum Economist; U.S. Energy Information Administration; World Markets Online.

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[U.S. Department of Energy's Office of Fossil Energy's International section - Bolivia](#)

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